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motions makes it practically certain that the two form a physical pair, and we may use the known parallax of the brighter star to determine the absolute magnitude of the fainter as soon as the apparent magnitude of the latter is measured. Because of the importance of knowing the intrinsic luminosity and spectral type of such stars, a series of observations has been made with the 60-inch reflector for the purpose of determining the magnitude and color of the faint companion.

The plates, each involving a polar comparison, are as follows:—

			No. Exposures		
No.	Kind	Aperture	Pole	Star	Magnitude
2830	Seed "27"	60 in.	2	2	13.13
2831	"Iso"	60	3	2	11.59
2832	"Iso"	60	1	2	11.36
2833	Seed "27"	60, 32	2	2	13.19
2848	Seed "27"	32	2	2	13.38
2849	"Iso"	32	1	2	11.56

The magnitudes have been corrected for atmospheric extinction.

The adopted photographic magnitude is 13.24, the photovisual 11.50, and the resulting color index, + 1.74, corresponds to color class *m4*. The relation between color and spectrum for stars as red as this is not definitely determined for the Mount Wilson photometric system. Provisionally, at least, we are justified in assuming that the spectrum of the star is not bluer than type M.

Assuming as the parallax of this star the weighted mean of the values derived by FLINT, and SMITH and ELKIN for Pi. 2^h123, the absolute photovisual magnitude is 12.3 ± 0.7, the probable error including the large uncertanties in the parallax and the errors in the magnitudes. The luminosity of the star is only one-thousandth that of the Sun. It is, therefore, one of the faintest stellar objects on record.

HARLOW SHAPLEY.

THE SPIRAL NEBULA MESSIER 33.

A 34½-hour spectrum of the bright knot 10 minutes of arc *nf* the nucleus of *Messier* 33 was obtained with the 60-inch Cassegrain spectrograph,[1] using a short focus camera of which the scale is Hγ — K = 7^{mm}. Three bright lines only appeared, 5007, *Hβ*, *Hγ*, from which Mr. ADAMS obtained a radial velocity of — 278^{km}. An exposure of 29 hours on the nucleus with the same instrument gave an extremely weak plate, from which it was deduced that the spectrum was continuous.

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[1] "Radial Velocities of 6 Nebulæ," *Publications of the Astronomical Society of the Pacific,* December 1915.

A small spectrograph was next constructed to work at the Cassegrain focus, using an 18-inch collimator, a 39° O 102 prism and a Dallmeyer cinematograph lens (F/A = 1.9) of 3 inches focus. The scale is Hγ — K = 0.9^{mm}.

An exposure of 32 hours early in December gave a very strong spectrum of the nucleus together with a fair spectrum of the nebula itself for a distance of a minute of arc on either side. The spectrum of the nucleus is about F_0, and that of the nebula appears to be of the same type. Measures of this plate by both Mr. ADAMS and Miss BURWELL gave a radial velocity of the order of — 70^{km}.

Unfavorable weather has prevented the obtaining of spectra of other knots to determine whether there is a progressive change in type from the nucleus to the edge and also whether or not the difference in velocity means a rotation.

FRANCIS G. PEASE.

THE PARALLAX OF 61 CYGNI.

Eighteen exposures made at the 80-foot focus of the 60-inch reflector give as the relative parallaxes and proper motions of the components of the well-known double star 61 *Cygni*:—

$$61_1 \begin{cases} \pi = +0''.325 \pm 0''.011 \\ \mu_a = +4''.107 \pm 0''.028 \end{cases}$$

$$61_2 \begin{cases} \pi = +0''.320 \pm 0''.008 \\ \mu_a = +4''.107 \pm 0''.023 \end{cases}$$

To convert the relative values into absolute parallaxes we should add about 0''.002. The absolute parallax determined by KAPTEYN from the results of several observers (*Gron. Pub.*, No. 24) is +0''.311. BOSS gives as the proper motions in α + 4.''164 and + 4''.132, respectively.

A. VAN MAANEN.